



CAESAR KLEBERG *Tracks*

— A Publication of the Caesar Kleberg Wildlife Research Institute —

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TEXAS A&M UNIVERSITY - KINGSVILLE

CAESAR KLEBERG *Tracks*

Volume 7 | Issue 2 | Fall 2022

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The Caesar Kleberg Wildlife Research Institute at Texas A&M University-Kingsville is a Master’s and Ph.D. Program and is the leading wildlife research organization in Texas and one of the finest in the nation. Established in 1981 by a grant from the Caesar Kleberg Foundation for Wildlife Conservation, its mission is to provide science-based information for enhancing the conservation and management of Texas wildlife.



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From the Director

A Calling

The Caesar Kleberg Wildlife Research Institute trains biologists and land managers. In doing so, we help these young people find careers that match their skill set and interests. Some students struggle to choose a career and the college experience can help them decide what career is right for them. Other students have a calling and always knew what they wanted to do for a career. These students simply need opportunities and gentle guidance to fulfill their dreams.

Like our students who have a calling, many people in the wildlife field have a calling. There is a song from the Broadway play *Come From Away* (I am a sucker for Broadway musicals) that captures the passion and drive of someone with a calling. The play is about a small town in Newfoundland that hosts 7,000 passengers from 38 jet liners forced to land after Trans-Atlantic flights because of the 9/11 attacks. The song called *Me and the Sky* is Beverly Bass's story.

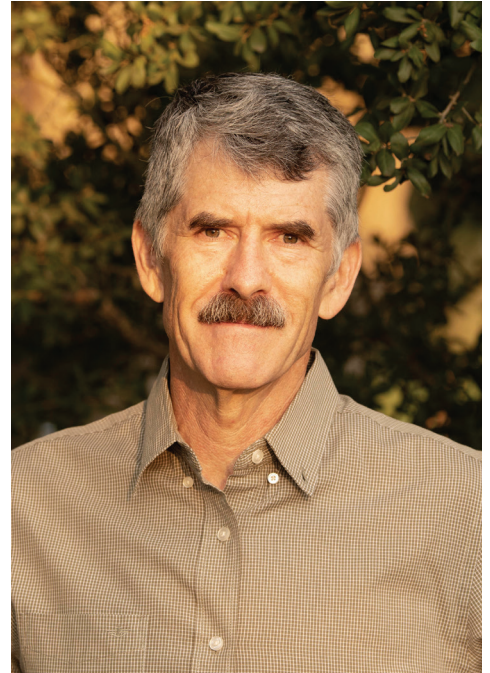
Beverly had a calling as a child to be a pilot. She became the first female Captain of American Airlines and piloted one of the planes that had to land in Newfoundland on September 11th. The song *Me and Sky* is powerful because it describes the passion and the journey of someone who knew exactly what they wished to do with their life.

It is a thrill to work with students, faculty, and supporters who have a calling to conserve wildlife. There is little need to coax or motivate such people; there is only a need to provide resources and opportunity. This issue of *Tracks* showcases such people, whether they are current students or scientists, alumni, or advisory board members. All of these people have a calling and it comes through in their work and actions to benefit range and wildlife resources.

All the best,



Dr. David Hewitt
Leroy G. Denman, Jr. Endowed Director of Wildlife Research



ONLINE

Learn more about the people of the Institute by visiting www.ckwri.tamuk.edu

SMALL YET STILL PRODUCTIVE:

The Influence of Dietary Energy on Deer Size, Antlers, and Reproduction

by Levi Heffelfinger, Ryan Reitz, Deanna Pfeffer, Randy DeYoung,
David Hewitt, and David Wester

We often observe regional body size differences at a local scale in deer species. For example, mule deer in the Texas Panhandle can achieve body and antler size rivaling their Rocky Mountain counterparts. Even within Texas, mule deer in the western Panhandle are larger than those in the Rolling Plains. Additionally, Hill Country white-tailed deer tend to be smaller than deer in other regions of Texas. In South Texas, deer near the coast on sandy soils are smaller than those inland on heavier soils. Usually, these differences between regions are attributed to nutrient availability, population density, land use patterns, precipitation, or soil type. These are all reasonable explanations for different body or antler sizes; however, the specific attribute that's driving this interaction is not well understood.

Several studies have evaluated regional differences in deer body or antler size. For example, in South Dakota, fawns were captured from two regions in the state where body and antler sizes of deer differed markedly. In captivity, fawns in each group were fed the same enhanced diet and body size was measured annually until animals matured. The group from the larger source population grew to be the same size as expected; however, the group from the smaller area failed to achieve an equal body and antler size. Both groups were allowed to reproduce so that the second generation could be evaluated. It wasn't until the second generation reached maturity that the two groups reached similar body and antler sizes. By the second generation on high-quality feed, deer from the area that produced smaller deer had grown to a body size equal to that of deer from the area of large deer. This demonstrates two important points. First, the condition of an individual's mother has a carry-over effect through the life of offspring, and even into the life of the original mother's grandchildren. Second, the ability for animals to adjust their growth (and thus maximum body or antler size) to a sudden increased nutritional source can take at least two generations.

Photo by
Levi Heffelfinger

"Usually, these differences between regions are attributed to nutrient availability, population density, land use patterns, precipitation, or soil type. These are all reasonable explanations for different body or antler sizes; however, the specific attribute that's driving this interaction is not well understood."



Many factors influence body and antler size of deer within a single generation—and these are generally referred to as either cohort or maternal effects. We all remember the drought of 2011. For those in charge of managed deer herds, we saw the drought’s negative effect on deer size and survival, and, in later years, on the population’s age structure. Often, a severe weather pattern (such as drought) can limit a single cohort’s body size and survival throughout that cohort’s lifetime. At an individual level, the mother’s body condition can affect lifelong body or antler size and survival of their offspring. These factors are often intertwined, where an event such as drought results in poorer forage which reduces female body condition. Then, it causes a negative effect on their offspring (maternal effect) across most of the fawns born that year (cohort effect). Interestingly, in these extreme cases, females will usually still produce fawns, though these offspring are less likely to sur-



Photo by Kerr Wildlife Management Area; TPWD

vive or may be smaller. The ability for deer to sustain reproductive output despite nutritional limitations is impressive and can be seen in Texas populations (Hill Country, sandy soil regions, etc.). In extreme cases, however, long periods of nutritional limitation may not be sustainable for reproductive output.

These ideas sparked recent research in a collaborative effort between the Texas Parks and Wildlife Department and the Caesar Kleberg Wildlife Research Institute. We used captive deer from the Donnie E. Harmel Research Facility at the Kerr Wildlife Management Area that had been living on the same diet. We “reverse engineered” the South Dakota study described above. We allowed this source population to reproduce and then split their offspring (a total of 309 fawns) into two nutritional treatments; a low and a standard digestible energy diet. We allowed each group free access to as much feed as they wanted. We followed these individuals to adulthood and allowed females to reproduce when they reached 4-years-old to assess the effects of a chronic reduction in digestible energy on reproductive output.

Our results were astounding. We observed differences between low and standard diet treatments as early as 1.5-years-old. Young deer in the low energy diet had smaller body weights, body length, antler size, and body condition. This trend was observed through nearly all later age classes and the differences became more pronounced with age. For instance, when bucks reached an age of 3.5-years-old, the low

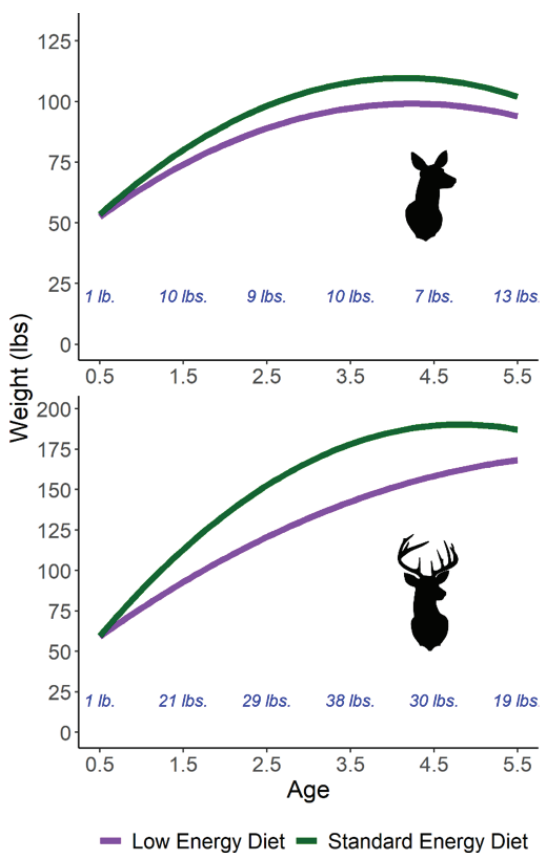


Figure 1. Average differences in body weight for females (top) and males (bottom) between the low energy and standard energy diet across age classes. The difference in pounds between the diet treatments for each age class are indicated in blue.

energy diet produced bucks 38 lbs. lighter compared to the standard energy diet (see Figure 1 for more). Further, antler size was 18-27 in. smaller within the low energy diet across all ages (Figure 2). Females continued to show smaller body size, weight, and condition measurements across most age classes.

These results highlight the importance of the nutritional environment in dictating growth rates and maximum size an individual can achieve, and further, they demonstrate that shifts in body sizes can occur rapidly within one generation. This differs from the reverse scenario in the South Dakota study where the adjustment occurred across multiple generations. Thus, deer appear to have a conservative strategy as they adjust to changing nutritional conditions: they are quick to reduce size if dietary energy is not sufficient to support a larger body or set of antlers but slow to increase size when nutritional conditions improve.

What was more interesting, though, was the carry over effect across generations within these dramatically different diets. Between the standard and low energy diets, reproduction rate, fawn birth weight, and litter size did not differ, even though the reproductive females had drastically different body size and condition. This shows that chronic low digestible energy cues a signal to reduce growth to match the nutritional environment yet still support reproductive output. By obtaining a smaller body size, individuals reduce energy requirements which enables them to remain functional even when conditions are poor.

These results have many implications for deer management, especially for some Texas populations. For instance, Hill Country deer are extremely abundant, yet are typically much smaller compared to white-tailed deer populations in other areas of the state. Available dietary energy may be a factor explaining these observations, where Hill Country deer are reducing their body size to match their nutritional environment but are still able to maintain reproduction and viable populations.

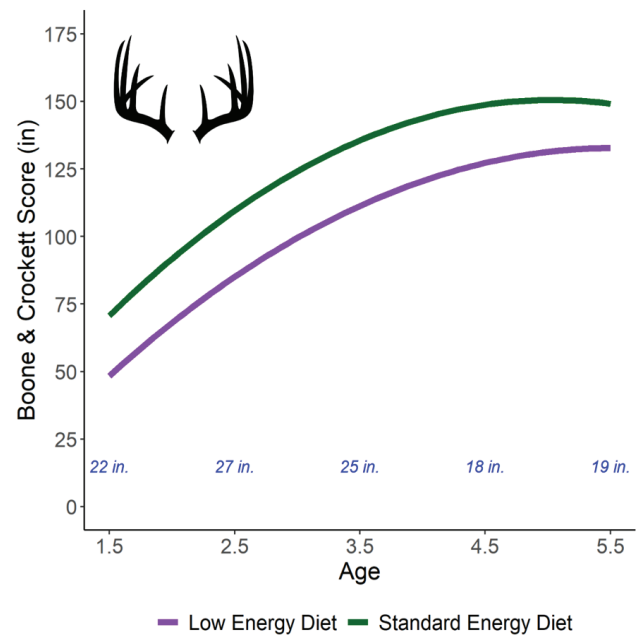


Figure 2. Average differences in buck antler size (Boone & Crockett score) between the low energy and standard energy diet across age classes. The difference in inches between the diet treatments for each age class are indicated in blue.

The ability to match nutritional intake based on the environment has both individual and population benefits. Our study suggests a cue directing deer how to allocate energy between current growth and future reproduction. Body mass, antler size, and body condition score, all indices of overall nutritional plane, diminished under a low energy diet. To our knowledge, this study represents the first specific manipulative test of the long-term effects of low digestible energy on growth trajectory that enables the deer to maintain reproduction. Understanding the link between dietary energy and nutritional condition will provide guidance for managers that experience regional differences in population performance and deer body size. Individuals in nearby populations may vary in body and antler size even though both populations appear to be performing well because of the ability to scale these size metrics to match the energy they obtain from their environment. Our study demonstrates this life-time adaptation, where a growth trajectory is cast on individuals at a young age based on the nutritional environment in which they were raised. 🦌

YOU & YOUR FAMILY PAINT WHAT?!

*by Scott E. Henke, Christin Moeller,
and Sandra Rideout-Hanzak*

Children provide one with unique experiences and often different perspectives than you may have ever dreamed. I [SEH] had such an experience recently when I was invited to give a presentation to a friend's 1st grade class. I had known the elementary teacher for several years and because I was a wildlife professor, she thought it would be interesting for her students to hear about wild animals from a guy who catches them for a living. I agreed because I thought, hey, the kids are only 6 years old, what could they possibly know about wildlife? I'll come back to that idea later.

I put together a 'show and tell' presentation with furs, feathers, skulls, shells, track impressions, etc. Basically, a lot of things that I thought would provide a "wow" factor. I was prepared to talk about differences between predators and their prey such as why eye sockets are in different locations on their respective skulls, and why teeth are different between the two groups of animals. Other things like why bird bones are hollow? How you can tell the difference between hawks and vultures while they fly overhead? Ultimately, a lot of wildlife trivia facts that the kids could take home to their parents to make their parents proud. I was packed and I had a plan.

On my way out the door to give my presentation, a graduate student of mine arrived with a Texas tortoise.



We had just begun a Master's project with Texas tortoises and I thought, this would make a nice live addition to my presentation. So, I placed the tortoise in a carrying container with some food and water and drove to the school. While driving to the school, I rehearsed the order of my presentation in my head. When I arrived at the school, I thought the presentation was perfect.

My teacher friend greeted me as I entered her classroom, and she introduced me to her class.



*Painted tortoise
Photo by Christin Moeller*

While we were all saying “Hi” to each other, I began unpacking my presentation items, placing them on a table in order of my rehearsed presentation.

A little girl saw the tortoise and shouted out, “My mom, Abuela, and I take walks on our ranch and pick them up. We paint them in our kitchen and then let them go in our backyard.” I quickly responded back, “Well this is a Texas tortoise and it’s a State of Texas threatened reptile species. No one is supposed to collect them for

non-scientific reasons and you should never paint them. Painting them can make them sick and die. It’s illegal to keep them in your backyard, and you could get in a lot of trouble for that.” Well ok, that’s what I thought in my head during the brief moment of silence after the little girl spoke. I didn’t actually say that to the kids. Being an articulate professor, I did say, “You paint what?” Ok, not a quick response, I know. But I did regroup and use the experience as a teaching moment.



Comparison of the same painted tortoise after a lot of work was put in to scrub off all the paint.

Photo by Christin Moeller

I told the class that Texas tortoises used to be very numerous in southern Texas. Their grandparents probably remember seeing tortoises every day because estimates from 50-60 years ago indicated tortoise numbers were about 8 tortoises per acre. Today, Texas tortoise numbers are less than 1 tortoise per 10 acres. That's a 98% decline in their population! Also, Texas tortoises could be found south of a line drawn from Del Rio to San Antonio to Victoria, Texas. Tortoises can still be found in that area but in small patches here and there. This is the reason why Texas tortoises are a threatened species, which means it is likely. . . A kid in the front shouted, "That means tortoises could go extinct." I said, "wow, that's right, 'threatened' means tortoises will likely keep declining until it is considered endangered of extinction or it actually becomes extinct unless something can be done to help them." I went on to explain that tortoises need a variety of plants to eat to maintain a healthy diet. I asked the kids what they thought would happen if they ate the same one thing every

meal, every day. Besides being a boring diet, they knew, at 6-years-old, that they would not get all the vitamins, minerals, and nutrients they need to live. This is, I explained, why Texas tortoises shouldn't be kept as pets in a backyard. Most lawns consist of a single type of grass, and that grass may not have all the vitamins, minerals, and nutrients needed by a Texas tortoise. Therefore, it is better to let them stay in a natural environment in which they were found. The kids shook their heads 'yes' in agreement, even the little girl who collected tortoises to paint.

I continued to explain why painting tortoises wasn't a good idea. I was surprised to hear that other kids admitted to painting tortoises too. I soon learned that tortoise-painting was actually a popular activity in southern Texas. This was a new cultural experience for me, but I grew up in the midwestern United States and we did not have tortoises. I have to admit though, when I saw my first Texas tortoise, my initial reaction was not, where is my paint set? So, I

explained to the class that the top part of their shell is called . . . and another kid yelled out “a carapace.” I was surprised. I asked, “How did you know that?”, and he said, “The Internet.” So, I said, “Ok, what is the bottom part of their shell called?” Another kid shouted “plastron.” I was shocked and said, “The Internet?”, and the kids said “Yes!” in unison. Even though these kids seemed well informed, I continued to explain that the carapace is made of smaller sections called scutes and the scutes are shed as the tortoise grows. However, if you paint a tortoise, the paint can act like a glue and hold the old scute in place. This can cause a thickening of the carapace and not allow it to grow. If the bottom of the shell, or plastron, which typically is not painted, grows normally, but the carapace can’t grow, this can cause the shell to crack under pressure and make the tortoise sick. Now unlike the Brothers Grimm or Mother Goose, who had tree limbs break and babies in cradles go hurdling to the ground (these were the stories told to me as a child), however, in these politically correct times with our millennial children, I withheld the more gruesome

parts of this story. The story about the painted tortoise whose shell cracked actually happened, but when the tortoise shell cracked, fire ants entered the hole and the tortoise died a horrific death due to shock. I left that part of the story out for the kids. Anyway, the kids decided that painting live tortoises was a bad idea and we made a pledge during class that no one would do so again.

As I ended that story, my teacher friend thanked me for my time and let me know that my hour was over, which was surprising because I never began my actual presentation. However, I believe the kids did learn some facts about at least one wild animal -Texas tortoises. But I believe I learned more from them. I learned that the generations of Captain Kangaroo and Sesame Street are things from the past, and to not underestimate this current generation of the Internet. Maybe someday I’ll get to actually give the presentation that I prepared.



Student Highlight

Mike Stewart, Doctoral Candidate

Project: Habitat use and population demographics of Gray Hawks in the Lower Rio Grande Valley of Texas

Mike is a native Texan who retired from the US Army in 2019. He completed a MS in Biology at the University of Texas Rio Grande Valley where he began studying Gray Hawks, a state-threatened species. He is currently working towards his PhD in Wildlife and Rangeland Sciences at Texas A&M University-Kingsville. His research is focused on determining Gray Hawk habitat requirements when selecting home ranges, creating a distribution model for the species in South Texas, and evaluating age-structured demographic parameters.





BOBCATS

in Working Landscapes of South Texas

by Aidan Branney, Michael Tewes, and Michael Cherry

Rangelands of southern Texas support a diverse array of plants and animals that rivals any ecosystem in North America. These ecosystems are sometimes heavily altered for the harvest of natural resources. A large portion of southern Texas rests upon the Eagle Ford Shale Play, one of the largest oil and natural gas reserves in the world which has led to record-high drilling and economic growth within the region. Furthermore, many of these properties also support robust populations of white-tailed deer, northern bobwhite, and cattle. To optimize the landscape for wildlife, livestock production, and energy extraction, requires the use of many tools including brush management.

Brush management often involves the control of brush via mechanical removal, controlled burns, herbicide, or a combination of these methodologies. These techniques are often employed in a systematic approach resulting in a mosaic pattern alternating between brush strips and treated areas characterized by grass and herbaceous ground cover. Treated areas provide early successional plants which are important for forage resources while the adjacent brush strips provide concealment cover and thermal refugia. While this optimization strategy has proved beneficial for integrating game management and livestock production objectives, there has been little assessment of how these approaches impact non-target species such as carnivores.

Bobcats are one of the most successful carnivores found in North America and can be found in a myriad of vegetation communities. Photo by Ben Masters



Photo 2. Brush management can take on many forms whether by mechanical removal, herbicide, or prescribed burn it will create mosaiced landscapes that will stretch on for miles as shown in this aerial photograph of a ranch in South Texas using brush management techniques. Photo by Google

Our objective was to study the impacts this form of management and landscape configuration had on habitat selection of carnivores such as bobcats within this system. We used bobcats as our model organism. Bobcats are a generalist species and can be found nearly everywhere in North America, however they are an ambush predator and rely on concealment cover to hunt and attack prey. Also, as one of the most common and largest obligate carnivores in South Texas, they have become the *de facto* apex predators in many systems making it key to understand their habitat selection tendencies.

GPS collared bobcat named HR9F, posing right in front of a trail camera. Photo by Aidan Branney



Habitat selection occurs where an animal uses a resource or type of vegetation disproportionately to its availability. The information derived from habitat selection can identify resources that are crucial for survival or reproduction and can provide valuable information regarding habitat management. Habitat selection is also a process that can occur at multiple spatial scales. From a single patch of brush to an entire network of brush across the landscape, selection can change for each individual. As ecologists, we often do not know the scales at which animals perceive and respond to our habitat management efforts. With this in mind, we wanted to investigate the scales of selection by bobcats in this managed environment and identify which scales were most important to bobcats.

We examined habitat selection of bobcats within their home ranges. We predicted that bobcats would select for areas closer to woody vegetation and areas with less fragmentation. We trapped 10 bobcats (6 females and 4 males) on the Hixon Ranch in La Salle County, Texas. Bobcats were equipped with GPS collars and tracked via satellite from May 2021- 2022. From aerial

GPS collar technology has allowed for scientists to get a closer glimpse into the patterns and behavior of animals. In this instance it allows us to gather data on bobcats within ranch landscapes. This animal was collared under all proper state and institutional permits and protocols. Photo by Ben Masters



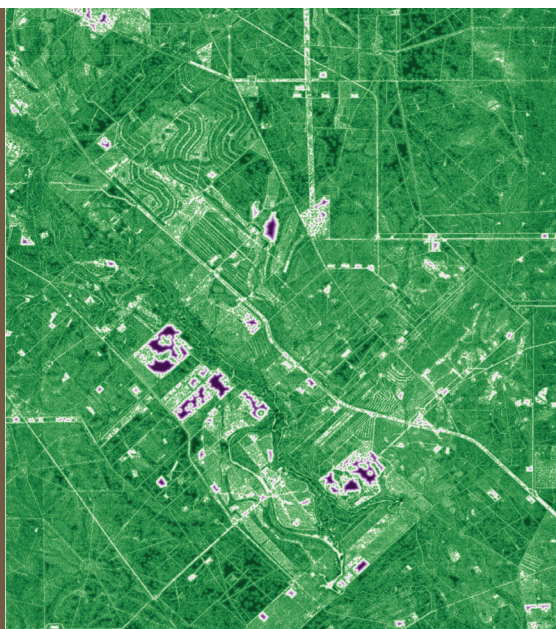
photography, we then classified the landscape into herbaceous vegetation, woody vegetation, water body, and energy infrastructure. From our classified imagery, we derived metrics of habitat fragmentation. In our study of scale, we generated three landscape measures of fragmentation and calculated them at different 10 levels increasing in size.

Bobcats within our study area selected for areas near woody vegetation and water, with lower levels of fragmentation, and abundant habitat edges, likely because these areas provide abundant prey adjacent to escape cover. Energy infrastructure had no influence on selection. Through our investigation of bobcat habitat selection at varying spatial scales, we found that bobcats responded most to aspects of woody vegetation at fine spatial scales. Bobcat space use was more sensitive to landscape fragmentation in their immediate environment than in the broader area. Within the treated brush management areas bobcat probability of use remained relatively high compared to areas that were mostly herbaceous vegetation with little woody cover. Bobcat probability of use declined in areas that are designated for grazing by cattle. However, overall bobcat probability of use was highest in larger patches of brush with little fragmentation.

This research expanded our understanding of how bobcats perceive and respond to multi-use land management strategies. Within this unique landscape, we showed that bobcats rely on the brush strips and are therefore important for bobcat presence within this environment. As brush strips can foster an abundance of prey such as quail, deer, and small mammals, these areas remain suitable for predators like bobcats. We were also able to demonstrate that there is a definitive scale that best describes bobcat habitat selection within this ecosystem. Using this understanding of bobcat habitat selection, land managers will be able to

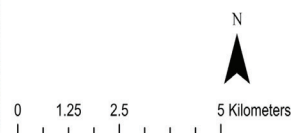
better understand how their brush management efforts influence carnivore distribution on the landscape. This work was made possible by the Tim and Karen Hixon Foundation which carries on the legacy of Tim's love for all the wild felids of Texas. 🐾

Projected bobcat habitat selection map across the Hixon Ranch area with data collected from 10 bobcats from May 2021-2022. With dark green representing high probability of use and purple representing low probability of use.



Bobcat Probability of Use

Value
High
Low



Donor Spotlight: *Saying Yes to Service*

by Lorie A. Woodward

Collectively, Henry R. Hamman, A.C. "Dick" Jones IV, and James "Jim" McAllen have contributed 95 years of committed, hands-on leadership to the Caesar Kleberg Wildlife Research Institute's (CKWRI) Advisory Board. After decades of service, the trio remains engaged as Emeritus Board Members. (Hamman will be recognized as emeritus effective January 1, 2023.)

"On most boards, people serve 3 – 5 years and can't wait to get off," said Dr. Fred Bryant, who served as CKWRI's Executive Director from 1996 until his retirement in 2016 and continues to assist Caroline McAllister with development. "Our advisors, on the other hand, can't wait for the next meeting. Their passion, enthusiasm and support is the foundation for the Institute, its people and its work."

Current CKWRI Executive Director Dr. Dave Hewitt concurred, "The Advisory Board's passion for wildlife conservation and enthusiasm for the mission energizes everyone at the Institute. Because they have our back and keep us pointed in the right

direction, the scientists and faculty at CKWRI can focus on what we do best—wildlife research and graduate student education."

Bryant continued, "We never saw the value in term limits. It doesn't make sense to ask people who are actively contributing to an organization's success to leave. The real advantage is having continuity over the long haul."

Dr. Sam Beasom, the Institute's first full-time executive director, with counsel from Dr. Charlie DeYoung, who was then-Dean of the College of Agriculture at the university, created the first Advisory Board. Initially, the board members were charged with helping set the Institute's research direction and keeping it focused. Over time, it has evolved and now the Advisory Board members also provide guidance and assistance with legislative matters, university administration concerns, state agency interactions and fundraising.

"Every member of the CKWRI's Advisory is prominent in their respective spheres of influence, which



gives the CKWRI a mystique that no other wildlife research institute possesses," Hewitt said. "That mystique helps us attract private supporters and research grants as well as the most qualified faculty and graduate students."

When Bryant arrived in 1996, there were eight board members. He set a lofty fundraising goal and sought their active participation in achieving the goal. The newly structured board rolled up their sleeves and went to work.

"We are proud that four original board members (Jones, McAllen, Stuart Stedman and Ben Vaughan) are still involved either actively serving or through their emeritus status, alongside 16 equally committed advisors who have been recruited along the way," Hewitt said. "The Advisory Board's unselfish service strengthens its ever-growing legacy every day."

Jones, who lives in Corpus and operates from his family's headquarters ranch headquarters in Jim Hogg County, and McAllen, who lives 35 miles north of Edinburg on the ranch stewarded by his family since 1791, joined the board in 1984. Hamman, a Houston businessman who ranches in Jim Hogg County, signed on in 2003 and served as Board Chairman for 10 years.

The power of long-term vision and long-term commitment are evident in the Institute's growth. In 1982, the Institute employed six administrators and support staff, six research scientists and a handful of graduate students. Today, the Institute houses 19 administrators and support staff, 31 faculty and research scientists, and 61 graduate students. As CKWRI and its work product have grown, so has financial support for its mission. In 1995, the endowment fund contained about \$3 million. Between 1995 and 2020, the fund's corpus grew 16-fold to more than \$50 million as new endowments were created.

"While our mission is wildlife-centered, our biggest asset is our people," Hewitt said.



Henry R. Hamman

"My interest in the board was two-fold. I'd always been fascinated by Caesar Kleberg and what he'd done as a pioneering wildlife conservationist. When I bought my South Texas ranch, I was committed to making it better for wildlife.

I knew who they [the scientists and volunteer leaders] were and what they did. I wanted them to help me accomplish what I wanted to and I wanted to help them accomplish what they needed to.

Through the Advisory Board, not only do we have access to the brightest minds in conservation, we work alongside neighbors. I'm not sure that I'd have met the people I have without my connection to the Institute. It's been a very enriching experience.

I always appreciated the fact that Institute scientists will collaborate with landowners to solve real world problems. In the process of doing that, the researchers turn private ranches into cooperative laboratories. For instance, tapping into the talent pool of the Institute and the Texas Native Seed program, I was able to complete a successful habitat restoration on my Hill Country Ranch.

They know so many things and have expertise that extends far beyond South Texas. By training graduate students from all over the country and all over the world, the Institute multiplies its reach and impact. Because of them, practical, science-based management ripples throughout the world."



A.C. "Dick" Jones IV

"I was invited to join by Harvey Weil, who I greatly admired. I accepted right away, and from the beginning, it has been a great institution to be involved with.

When I first went on the board, I was not even sure of what our exact missions and goals would be. It has been wonderful to watch it evolve and expand into a great institution that truly makes a difference for wildlife and landowners.

As an Advisory Board member, I have always enjoyed attending the CKWRI meetings, learning about and witnessing the many improvements and advancements made by our great scientists here in Kingsville. Their many advancements in the world of wildlife and habitat are also very important and beneficial to the Ranching and Hunting businesses of Texas.

This institute never tires of learning about, and improving wildlife and habitat!"



James "Jim" McAllen

"I said yes because of the people involved. They were all old, experienced, respected ranchers who had fought the battle every day to manage their wildlife, their livestock and their relationships with all of the agencies. Their interests fit parallel with mine, so if they were supporting CKWRI it made sense for me to do the same.

I always found it interesting to travel to other Advisory Board member's ranches across the state to see and learn first-hand how they were managing their resources in different environments. You know, the Pineywoods and the Panhandle are a lot different than the Rio Grande Valley and the Brush Country—it's good to learn from the people who are doing what we all love in different conditions because it stretches the way you see the world and think.

Nothing the Institute does is political. It's all science. Nobody has an agenda except for increasing usable science-based information and improving natural resource management. The researchers' love for wildlife and respect for landowners is an equalizing and driving force. They look at issues head on and ask, 'How can we improve the situation?'...whatever the situation is.'

Through the years, it's been an honor to have input on the research projects to ensure they'd have application on our land, so we could all manage resources better."

Continuing to Say Yes

In lives defined by community service, the men all agree that serving on the CKWRI's Advisory Board is a meaningful and satisfying experience. While the words were slightly different, the sentiment was the same as that expressed by Jones.

"The Institute provides a lot of great service for landowners and wildlife here in South Texas and beyond. Its work shapes the landscape today and in the future. Frankly, it's wonderful to be part of that." 🌱

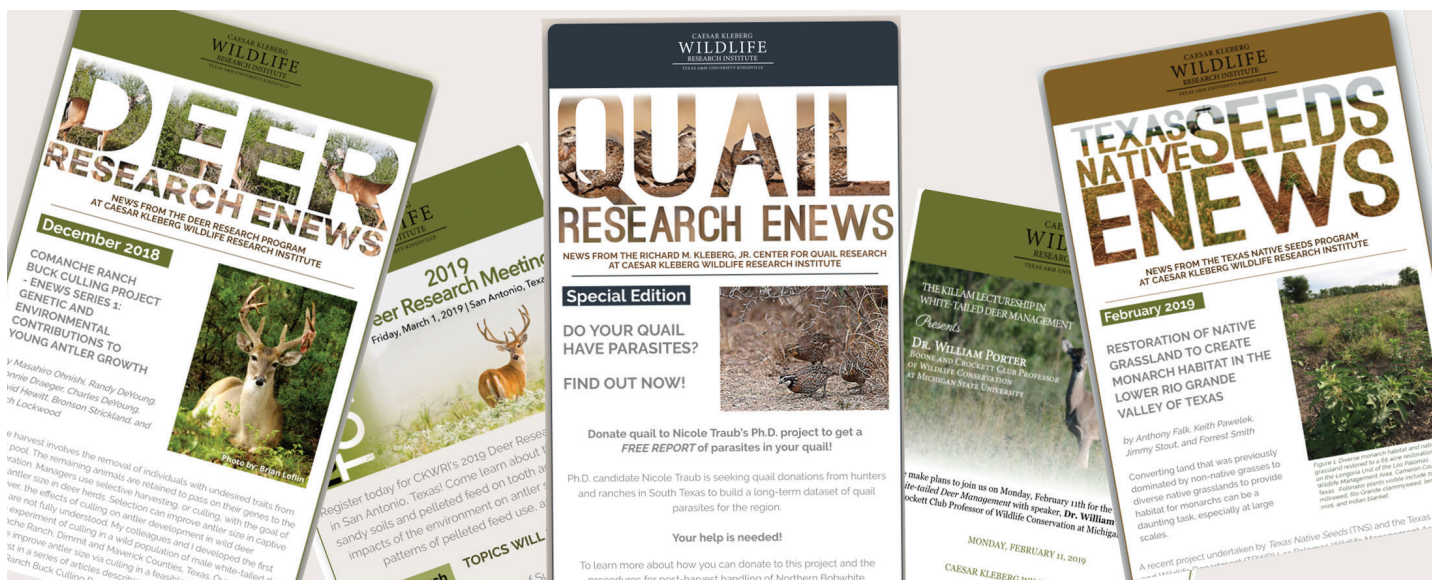


Board members gathered to recognize Jim and Dick for their many years of service. Pictured top left to right: Tio Kleberg, Tim Leach, Chad Auler, Ken Leonard, Barry Roberts, Jeff Hildebrand, Ellen Randall, Bryan Wagner, Gus T. Canales, David Killam, Stuart W. Stedman, Mason King, and Chris Kleberg. Seated: Jim McAllen and Dick Jones. Not pictured: Henry Hamman, who will become emertius January 1, 2023.

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RESTORATION ECOLOGY-

“Well, It Depends...”

by David B. Wester



A famous ecologist wrote, “Ecology is a science of contingent generalizations.” It’s true, but this is an idea that is easier to understand if we translate it into what often becomes the first three words of the answer given by ecologists to almost any question: “Well, it depends... .”

There is a clear contrast between the ecological and the physical sciences. Ask a physicist how fast a ball falls in a vacuum near the earth’s surface, and you will not hear from her, “How heavy is the ball?” Instead, our physicist friend will give us a confident response: “Its acceleration is 32 feet per square second,” accompanied by a triumphant smile. Because that’s the answer, no matter how heavy the ball. Light travels 670,616,629 mph in a vacuum, too, regardless of the frame of reference. And pure water freezes at 32°F—every time.

But an ecological question receives a qualified answer, an answer that depends on a whole lot of factors. Another way to put this is to say that an ecological question, however innocently posed, might well have several answers, each of them correct given the setting.

You might think, “Goodness, this contingency, this uncertainty, would drive a physicist crazy.” And many other people, too, who see a black-and-white world with hard edges and clear boundaries. Perhaps. But it is equally true that this hints at an astonishing complexity in nature whose attraction is compelling because it reflects a creation revealed not in black and white but as a kaleidoscope of colors. Instead of edges, we discover a reality that is delicately layered and intricately laced. In fact, the ecologist quoted earlier was Robert M. May, who earned

his Ph.D. degree in theoretical physics before crossing over to the ecological sciences.

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”

Nowhere is this perspective more apparent—or more challenging—than in restoration ecology where we face disturbances that exist across multiple scales of space and time. For example, in a very local setting, an energy pipeline might be constructed across your ranch this summer, and your goal is to establish native grasses along its right-of-way as soon as possible. On a broader scale, predicted climate change scenarios that will play out over decades to come highlight what ecologists have always known: our biosphere is dynamic and always has been. Local restoration efforts must recognize that future conditions may be as hard to adapt to as they are to predict accurately. Our challenge, then, is to develop restoration strategies that can be successful because they capitalize on the adaptability of species to changing environments, because they possess what ecologists call “resilience”: the ability to respond to stress or disturbance by resisting damage and by recovering quickly.

In technical parlance, we often read that “both abiotic and biotic drivers underlie community assembly rules and dictate trajectories of eventual outcomes.”

All of this is true, of course, but it is much more to-the-point simply to admit, “Well, it depends... .”

Here’s an example. Consider a restoration project that involves drilling mixes of locally- adapted native grass seeds into a pipeline right-of-way. A critical factor determining success is the fact that these are seeds of plants that are adapted to the environments they will face. But beyond that, a cloud of questions crowds the mind:

- *What time of year is it? Mid-summer, when soil surface temperatures can exceed 140°F and rainfall is scant? Or early spring just before seasonal precipitation is expected?*
- *What lies just beyond the right-of-way? Is it rangeland that hosts a diverse mix of native shrubs, grasses and forbs? Or is it what has been so aptly described as “a sea of the wrong grasses”—grasses prodigious in their reproductive capabilities and invasive in their behavior (buffelgrass and a variety of old world bluestems come to mind)—that dominates uncountable acres in south Texas?*
- *Even though we plant native grasses along our right-of-way, the soil contains hundreds of seeds per square yard that comprise the resident seed bank—can our seeded grasses find their place in this soil?*
- *What about grazing animals? Can we rest the pasture so that establishing grasses can avoid being grazed during their first growing season?*

There is ample evidence that each of these factors affects restoration success. More profound,

though, are the ways in which these factors interact with each other.

And if one is tempted to say (as this list of mitigating factors grows long), “Finally, what about...?” then our humility pulls us up short... because this list has no end.

A second example. Standard restoration guidelines recommend stock-piling top soil following pipeline or fracking pond construction. After all, this top soil is the link between the inorganic and the organic world—it is the medium in which and through which plants acquire nutrients for their own growth, and ultimately, of course, nutrients that every other living organism requires. Hence, stock-piling this resource for future use seems obvious to many ecologists. We recently completed a monitoring project that documented restoration outcomes on a retired fracking pond. In this project, we distributed a five-year old stock pile of top soil in different layers over the fracking pond surface, and then we reseeded it with a mix of native grasses. Our experiment also included fracking pond surfaces that were neither resurfaced with stock-piled top soil nor reseeded with locally-adapted grasses. We monitored plant density and species composition annually for four years. To our surprise, we documented the highest density of native grasses and the fewest invasive grasses on those portions of the fracking pond that were non-amended, either physically with top soil or biotically with native grasses.

One is tempted to say, “Well, that’s not supposed to happen—we’ve always stock-piled our top soil.” But it did happen. Something about the initial setting of this fracking pond, coupled with subsequent conditions that it experienced,



Coastal Plains little bluestem (left) and Lavaca Canada wildrye (right), two native tallgrasses two years after restoration in northeast Texas. Photo by: Tyler Wayland

took its trajectory along an unexpected path, a path that, by any standard, would not have been predicted.

This is one of the reasons why many ecologists recite that practiced preamble to every question they answer: “Well, it depends...” But more to the point, when something unexpected happens, then we realize how little we understand and how much we have to learn. Katharine Stuble and her colleagues expressed this by including the phrase, “Every restoration is unique” in a published paper. They wrote that their findings confirmed “the idiosyncratic nature of results of restoration efforts,” that their data provided strong evidence that “restoration outcomes are

highly contingent on external factors that vary both spatially and temporally,” and that these factors are “largely beyond the control of the restoration practitioner.”

A mentor of mine—a scholar with many years of on-the-ground experience—reminded students, in every range ecology class he taught, of a perspective that Robert May surely realized early in his ecological career: “This isn’t rocket science...it’s harder than that.” We, too, acknowledge the complexities of nature and we embrace the challenges before us. And we look forward with excitement to a future with our hope-filled restoration goals achieved. 🌱



BECKY TRANT: *The Secret of CKWRI's Success*

by Fred Bryant and David Hewitt

At CKWRI, we do a pretty good job of sharing our success in applied wildlife research, graduate student education, and donor support. Those are the pillars of the Institute's accomplishments. In this issue of *Tracks*, we want to share a behind-the-scenes story that is heartwarming, captivating, and a tribute to one person's impact on who we are and what we do.

This story begins in 1986 when Becky Trant was hired to be the Institute's Administrative Officer. The Institute was a fledgling organization with a new Director in Sam Beasom, and a handful of scientists and staff. It desperately needed someone with (1) organizational skills, (2) a command presence with staff, students and scientists, (3) a willingness to fight for what was right for the Institute at a small teaching university that didn't understand or appreciate research, (4) the brain power to work with and educate federal and state contracting officers, and (5) a caring, compassionate attitude toward young graduate students from all over the country, who were trying to find their way.

Born into a modest family with hard working parents, Becky learned from the school of hard knocks. She graduated with her high school diploma in 1968, not knowing she would be battling academic Deans, Provosts, Chief Financial Officers, and even University Presidents for what is best for the Institute and how it should operate. No challenge was too big or too daunting for the young woman from Bay City, Texas.

At the time Becky went to work for CKWRI, its support system for research was understaffed and inadequate to handle all of the complexities of running a privately funded Institute imbedded in a public university. Issues such as oversight of a fleet of trucks, a research unit that covered all of South Texas instead of working in a classroom, and private funding to support the effort that was hampered by awkward and cumbersome sets of state and university guidelines were just a few of the challenges to overcome.

By the time Fred Bryant arrived in 1996, Becky knew the only way to operate this program was

to hire the people it would take to make the Institute run smoothly, which included hiring staff to handle contracts, payroll, travel, inventory, publications, printing, website management, and the like. With private donors stepping up to help, new staff was recruited to take on these challenges and relieve the scientists and students from mundane university tasks so they could focus on what they do best—wildlife research. She was devoted and committed to making it all work. Becky told Fred on his first day on July 1st, 1996, “You get out of the office and meet our constituents. I will put out fires and squash bugs”.

Fred recalls her unbelievable skill set this way. “Becky was kind and considerate to everyone, but she had little patience with anyone who stood in the way of the Institute’s mission. Armed with a high school diploma, she would go toe-to-toe with accountants, contracting officers, university administration, and PhD’s on core issues. If Becky was heading across the street, I can only say that whoever she was seeing that day better bring their A game because no-one at the conference table was going to be better prepared than Becky. Everyone on campus respected not only her intelligence and her ability to do the ‘homework’, but her steadfast devotion to and defense of CKWRI’s mission.”

Dave Hewitt took over as Executive Director in 2017. Dave remembers “With Becky’s deep knowledge of CKWRI and TAMUK, I was able to rapidly transition into the Director’s position. Becky is the first person you’d pick if you were putting together a team to support the Institute. She has been a mother hen to the Institute’s staff and a lion in defense of the Institute’s interests.”

Tio Kleberg, the founding Father of the Institute, recalls “Becky is the type of home-grown person





Becky Trant with the current (Dr. David Hewitt - far left) and previous executive directors (Dr. Fred Bryant - left and Dr. Charlie DeYoung - right) of CKWRI.

that Caesar Kleberg would have appreciated. She cultivates connections, treasures friendships, is dedicated to South Texas and its people, and is guided by firm principles. She has been a blessing to CKWRI, TAMUK, and the Kingsville community.”

True to her humble spirit, she always preferred to stay in the shadows and let others get the glory. She did this throughout her 44 years of service at the University. Becky cherished her operations staff of 14, and each and every one of them knew it. Birthdays and holidays were notorious with luncheons and gifts, especially at Christmas. Being the strong person of faith that she is, Christ’s birthday was always a day of celebration at the Caesar Kleberg Wildlife Research Institute.

South Texas Charity Weekend could never have been successful without Becky’s expert guidance, her “do it right or don’t do it” ethic, and her leadership skills to pull everyone together. She always made it happen behind the scenes. No one will ever know the amount of work and effort that goes into this spectacular event, that is arguably South Texas’ best and finest fund raiser for local charities. While appearing to run smoothly to our

guests, she masterfully covered bumps, bruises, and train wrecks that come each year with a busy weekend of complicated activities.

Becky is very attached to the greater community of Kingsville, Texas. She and her late husband Tommie, contributed in many ways. But when Tommie passed away, she decided to create a memorial at Spohn Kleberg Hospital in his memory. A once-vacant, open-air patio inside the hospital is now a place where patients, nurses, visitors and doctors go to relax, reflect and meditate in the “Tommie Trant Memorial Garden”.

Those of us who are fortunate to have worked with Becky in her 36 years of dedicated service to the Caesar Kleberg Institute, know that she poured her heart and soul into Texas’ finest wildlife research program. The Institute would never have known the same level of success without her. We will miss her dearly and wish her nothing but the best in her retirement. An endowment has been created in her name for those who might want to recognize the many contributions she has made to CKWRI. 🙏

ALUMNI

Spotlight

Jen
MOCK

CKWRI Class of 2004,
President, JMS Natural
Resource Strategies, LLC
Dripping Springs, TX

What is your background with the Institute?

I was a technician on several graduate projects for the Institute before becoming a graduate student and working with Dr. Tewes. I studied the spatial patterns and habitat use of an unharvested bobcat population on the Aransas National Wildlife Refuge.

What are you doing now?

I moved back home to Texas and started a new consulting firm in 2021 called JMS Natural Resources Strategies (JMS NRS), LLC, after working for the Association of Fish and Wildlife Agencies (AFWA) for 19 years in Washington, DC, the last nine years of which I was the Government Affairs Director. My goal is to be a bridge between people and our nation's natural resources, laws, policies, and program implementation that benefit fish, wildlife, their habitats, people, and communities for a healthy and sustainable future. I work on federal legislation and policies and programs in the fish, wildlife, and natural resources space with many state fish and wildlife agencies, nongovernmental organizations, federal agencies, and others.

JMS NRS is a woman-owned, small business that provides specialized consulting services to entities that have an interest in fish, wildlife, and conservation of their habitats; natural resources management; science and research; land management and public access; hunting, fishing, and other forms of outdoor recreation; sustainable use of our natural resources; the federal laws, programs, policies, and cultures that drive actions and decisions; and relationships between state and federal natural resource and land management agencies, private landowners, and other stakeholders. My services can include federal policy analyses, advocacy, coalition building, education and outreach, government agency coordination and relations, and federal program troubleshooting and problem solving. I also work within the State of Texas and with national, multistate, and regional entities.

In September 2022, I was recognized as a national expert in my field by AFWA with the prestigious Gary Taylor Award for excellence in national conservation policy. It was a tremendous honor, and the award is named after my mentor and dear friend.

How does your time at CKWRI continue to affect you today?

Working with the Institute instilled in me the foundational perspective that private landowners are of paramount importance and are pivotal to successful conservation of fish and wildlife species across this country. Because seventy percent of the lower United States is privately owned, many species rely on habitats found on private lands to meet their life cycle requirements, survive, and thrive. My early experiences with Texas landowners through the Institute shaped the initial lens through which I do my work – first, it's always from a private lands perspective before assessing impacts to the other stakeholders. This foundation continues to serve me well throughout my career.



In 2022, Jen received the Gary Taylor Award for excellence in conservation policy by the Association of Fish and Wildlife Agencies (AFWA). Pictured L-R: Director Chuck Sykes, AFWA Executive Committee; Director Tony Wasley, 2021-2022 AFWA President; CKWRI Alum Jen Mock Schaeffer; and Director Mark Tisa, AFWA Awards Committee Chair.

Caesar Kleberg Wildlife Research Institute
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The Caesar Kleberg Wildlife Research Institute, a nonprofit organization, depends on charitable donations to support its work. By making a tax deductible contribution to the Institute, you will help us continue to provide science-based information for enhancing the conservation and management of Texas wildlife. Please consider making a gift today.

Learn more about how you can make a difference for the wildlife of Texas by visiting www.ckwri.tamuk.edu/giving.



Photo by Ben Masters